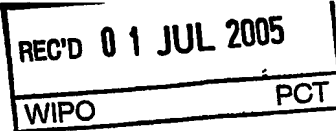


# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)




Applicant's or agent's file reference SMR/P550551PC	<b>FOR FURTHER ACTION</b> See Form PCT/PEA/416	
International application No. PCT/GB2004/001164	International filing date (day/month/year) 18.03.2004	Priority date (day/month/year) 21.03.2003
International Patent Classification (IPC) or national classification and IPC B22D41/005, B22D41/01, B22D11/06, B22D11/17, B22D11/19, F27D23/00, F27B14/06, H05B3/62		
Applicant PYROTEK ENGINEERING MATERIALS LIMITED		

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 5 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
  - ☐ sent to the applicant and to the International Bureau a total of sheets, as follows:
    - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
    - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
  - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

- This report contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand  10.09.2004	Date of completion of this report  30.06.2005
Name and mailing address of the international preliminary examining authority:   European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Telephone No. +31 70 340- 3820 Hodiamont, S.



**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/GB2004/001164

**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

**Description, Pages**

1-11 as originally filed

**Claims, Numbers**

1-36 as originally filed

**Drawings, Sheets**

1/7-7/7 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/GB2004/001164

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	1-36
	No: Claims	
Inventive step (IS)	Yes: Claims	1-36
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-36
	No: Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)

International application No.

PCT/GB2004/001164

Re Item V.

1.)

The following documents are referred to in this communication:

D1 : WO 97/16051 A

D2 : DE 197 52 548 A

2.)

The subject-matter of claim 1 is **novel** (Article 33(2) PCT).

Document D1, which is considered to represent the most relevant state of the art, discloses (the references in parenthesis applying to this document): an electric heating unit arranged in one or more closed cavities (2) in a block (1) for use in a continuous casting installation.

From this, the subject-matter of independent claim 1 **differs** in that :

said heating unit including a heating chamber for liquid metal having an inlet and an outlet, the heating chamber being constructed and arranged for a continuous flow of liquid metal through the chamber from the inlet to the outlet, and at least one thermostatically controllable electrical resistance heating element mounted within the heating chamber below the level of the outlet, said heating element being constructed and arranged to heat liquid metal flowing through the chamber to a predetermined liquid metal temperature.

2.1)

The **problem to be solved** by the present invention may be regarded as:  
Varying melt temperature and consequently nonuniform grainstructure.

2.2)

The solution to this problem (**effect** of the invention) proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

By providing a heating unit with the features of claim 1 a uniform temperature of the melt is given and the quality of the cast product is better.

2.3)

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

PCT/GB2004/001164

Claims 2-16 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

3.)

The subject-matter of claim 17 is novel and inventive, because the heating unit (see claim 1) is part of the casting installation and not known from the prior art as described above.

3.1)

Claims 18-24 are dependent on claim 17 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

4.)

The subject-matter of claim 25 is therefore novel and inventive too, because a method is claimed, where the heating unit of claim 1 is used.

4.1)

Claims 26-36 are dependent on claim 25 and as such also meet the requirements of the PCT with respect to novelty and inventive step.